

## Claims

1. (Twice Amended) A method for determining the position of a mobile station located in a coverage area of a base station in a radio system and for using location information, in which method the base station comprises equipment for receiving signals from the same mobile station simultaneously by at least two antenna beams directed in different directions, the method comprising:

- measuring signal levels of signals received from a same mobile station by different antenna beams of said base station,
- comparing the signal levels of the signals received from the same mobile station by the different antenna beams,
- determining a direction to the mobile station in relation to the base station on the basis of a relations between the signal levels measured for the different antenna beams, and
- calculating a distance from the mobile station to the base station on the basis of a timing advance, given to the mobile station by the base station and propagation speed of the radio signals, wherein said distance and said direction is used for making a decision whether or not said mobile station should be transferred to another base station by a handover.

B<sup>2</sup>

1            5.     (Amended Thrice)   Base station (BTS1) of a radio system, which base  
2   station comprises:  
3            antenna equipment for receiving signals from a certain mobile station  
4   simultaneously by at least two antenna beams directed in different directions,  
5            measuring equipment for measuring the signal levels of the signals received by  
6   the different antenna beams,  
7            equipment for defining a timing advance for the mobile station which is in radio  
8   connection with the base station to compensate for a time lag caused by the distance  
9   between the mobile station and the base station, and  
10           calculation means which are responsive to the measuring equipment for  
11   determining the direction from the base station to the mobile station on the basis of the  
12   relations of the signal levels measured for the different antenna beams, and which  
13   calculation means comprise equipment for calculating the distance between the base  
14   station and the mobile station on the basis of the timing advance defined for the mobile  
15   station and the propagation speed of the radio signals,  
16           wherein said calculation means are adapted to transmit said direction and said  
17   distance further in the system in order to be used for making a decision whether or not  
18   said mobile station should be transferred to another base station by a handover.